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Summary of qualifications

I am a software architect and a tech entrepreneur.

My software development background includes 15 years of experience in designing and developing networked, distributed, high load, Web systems (including UIs), computer science, leading teams and projects, helping people expand their business and technological potential.

As an entrepreneur, I (co)founded and (co)developed few start-ups, namely a professional social network, an online chat service, a CRM/ERP SaaS for small businesses, and a powerful personal GIS platform.

I had also worked on online education systems, massive-scale anti-spam systems, IT/ network infrastructure systems, security (including running personal honeypot systems), online retail systems, machine learning-based data analysis systems.

While doing this, I developed three Web/UI architectures (frameworks), a package system, a build system, a language for creating DSLs targeting web development.

I had spoken on several conferences and meetups, created and contributed to several open-source projects.

Having worked with a wide spectrum of technology, from x86 assembly language to dependently types functional languages and proof assistants, with deviations into networks, security, systems, I came to my current preferred design space and tools, which include strong advanced type systems, pure functional languages (like Haskell, Purescript), flexible encapsulated state-based architectures.

Talks

Modern Web apps architecture based on FP and FRP, in a scientific context

The talk presents the big picture of modern human knowledge in areas of mathematics and computer science, explains why functional programming with types matters, how functional reactive programming is derived from functional programming, and how to apply it to solve a real-world software engineering problems.

Evolution of Web application architectures
The talk outlines challenges arising with the growth of Web applications in size and complexity and provides a solution (an architecture and an ecosystem) for this problem.

DNA language
The talk presents a protocol-based language for creating DSLs for scripting web pages.

Pure functional web development with Purescript
The talk outlines trends and problems in web development and explains how to address them using pure functional programming - the Purescript language.

Work experience

2016 .. 2019

Worked at Beautiful Destinations leading frontend, and later all the tech efforts in the company.

Developed an FRP-based web UI framework, and few large complex web applications based on this framework (in fact, one of the largest FRP-based web applications in the world totaling in 60K lines of Haskell code). This architecture is based on locally-stateful components and avoids global state, thus is very flexible and scalable.

The backend is built using a horizontally-scalable microservices-based architecture. It is capable of running machine learning algorithms over huge amounts of media data, is flexible and has no single point of failure.

We had also built a sophisticated build and deployment system based on Docker.

All of the above is built using Haskell language.

An FRP library and a virtual dom library we had developed for this project are now open-source: github.com/LubeckFRP.
Also submitted fixes and improvements to GHCJS open-source project.

Project role:
head of engineering, software architect.

Tools & technologies:
PostgreSQL, Haskell, GHCJS, Purescript, Docker, AMQP/RabbitMQ, many machine learning frameworks, many external APIs integrations.

2016 .. 2019 Research projects

Spin the Globe: an application for tracking a list of visited countries, with suggestions on next destinations. It is written to explore 3D graphics in web pages and build a declarative, virtual dom-like DSL for scripting 3D scenes. Development in progress.
github.com/EugeneN/spin-the-globe

Tools & technologies:
Haskell, three.js.

MLTool: a tool for building datasets for machine learning out of media data. It implements a full-featured raster and vector canvas-based graphics editor, a visual form builder with a rich text editor, supports multiple user roles.

Tools & technologies:
Haskell, Easeljs, PostgreSQL.

virtual-dom: a virtual dom library with support of static stateful elements for Haskell. It is written to address an abstraction leak in existing virtual dom libraries which do not implement static stateful elements.
github.com/EugeneN/haskell-virtualdom

Tools & technologies:
Haskell.

2012 .. 2015

Worked at Evo (a multinational online shopping and business services provider: prom.ua, tiu.ru, satu.kz, negociol.com, ticiz.com) as team lead, software architect, functional programming and computer science evangelist, and mentor.

Designed a scalable architecture/framework for dynamically (re)composable web applications and a modular multi-language ecosystem for this architecture. Then evolved legacy "big ball of mud"-style application into this architecture with zero downtime and zero regressions.

In the process, I had built guidelines, constraints and a development process for a client-side application project for a team of about 50 software engineers.

Designed and implemented a multi-language build system targeting Javascript, a year ahead of the rest of the industry. It is open source now.
github.com/EugeneN/cafe

Developed a simple concatenative reactive programming language for web development. This language makes asynchronous code look the same as and compose transparently with synchronous code to solve the "callbacks hell" problem. It is open source now.
github.com/EugeneN/DNA.js

Developed an incremental boot-loader for rich web applications, which loads and applies binary patches of the application's code and makes the application code a first-class resource. It is open source now.
github.com/EugeneN/vcdelta

Project role:
project lead, team lead, software architect, mentor.

Tools & technologies:
Python, PostgreSQL, MongoDB, Redis, Solr, ElasticSearch, Spark, Javascript, CoffeeScript, Node.js, ClojureScript, Elm, Purescript, Docker.

2012 .. 2015 Research projects

CMD: a markdown editor for Github Gists. The app explores serverless architecture, alongside with reactive and functional programming and multiprocessing for web applications.
eugenen.github.io/C.MD

Tools & technologies:
ClojureScript, Github Gist API, Web workers, RxJs, React, Ace editor, Highlight.js, Disqus comments API, Google Fonts API.

twic & twic2: Experimental Twitter clients with clean UI and simple UX. Written to explore different component models for web applications and usage of immutable cloud database as a source of eventual consistency. Later converted to a platform for teaching functional programming and FRP.
github.com/EugeneN/twic
github.com/EugeneN/twic2

Tools & technologies:
Haskell, Purescript, Twitter REST API, Twitter Streaming API, RxJs, ReflexFRP.

pureGoL: "Game of Life" game written as research on decoupling user interface from application core. It has a stateful core and a few distinct interchangeable stateful user interfaces: a React one, a canvas one and a command-line one.
eugenen.github.io/pureGoL

Tools & technologies:
Purescript, RxJs, React, HTML5 canvas.

2010 .. 2011

Worked on a couple of large enterprise projects at SoftServe, Inc (one of the leading Ukrainian outsourcing companies), and later directly for Cisco Systems, Inc (remotely):

Worked on a set of RESTful backend services in a large real-time platform for online testing in an online learning system. Wrote a custom dialect for Python's SQLAlchemy library for MS SQL Server 2000. Also, I was involved in architecture assessments and proposals for a few other related projects.

Customer:
Pearson.

Project role:
back-end team lead, software architect, software developer.

Tools & technologies:
Python, MongoDB, MS SQL Server, REST, JSON.

Worked on parts of the Cisco IronPort Email and Web security Appliances cloud services. The application is a set of tens of microservices each scaled to thousands of machines for scanning and categorizing global email and web traffic in real time.

Designed from scratch and implemented an LDAP-based administration tool for managing IT infrastructure. This tool features a rich web client application and API-driven server service.

Customer:
Cisco Systems, Inc.

Project role:
software architect, software developer.

Tools & technologies:
Python, MySQL, LDAP, Javascript, YUI, REST, JSON, Django, FreeBSD.

2009 .. 2010

Co-founder of G4 startup. The startup has had developed a rich web application for managing geospatial data – GPS tracks, waypoints, geotagged items, custom maps. The application features real-time data categorization and clustering, real-time push-based internal API, external RESTful API, spatial search, uses advanced HTML5 features like drag-and-drop multi-file upload, sound effects, interactive SVG charting.

Project role:
Co-founder/CTO, software architect, software developer.

Tools & technologies:
Python, GeoDjango, Celery, PostgreSQL, PostGIS, Javascript, YUI, REST, JSON, GeoJSON, AMQP, Comet, Google Maps API, OpenLayers API, OpenStreetMap API.

2007 .. 2008

Founded a company which developed a CRM/ERP platform for small businesses. The platform provides a set of standalone services for managing finances, goods, employees, business documentation. All the applications make use of single sign-in capability, shared users profiles and sophisticated hierarchical access control rules. The system uses an immutable (append-only) database for business data and per-action-per-user log with an ability to rollback any changes.

Project role:
Founder/CTO, software architect, software developer.

Tools & technologies:
Python, Perl, PostgreSQL, Javascript, YUI, jQuery, REST, JSON, Google Maps API, Google Data API, MS Office API.

2005 .. 2006

Co-founded an online distributed chat platform Jabber.te.ua. It was an online chat service integrated with email and SMS messaging, other IM services, featuring web history service (a notable achievement for distributed systems).

Project role:
Co-founder/CTO, software architect, software developer.

Tools & technologies:
C, Perl, MySQL, Erlang, LDAP, Javascript, XMPP.

2004 .. 2005

Co-founded a social network for professionals. It was a web site integrated with an IRC instant messaging service, and augmented by several automated chat bots. The service was hugely popular among a network of universities.

Project role:
Co-founder/CTO, software architect, software developer.

Tools & technologies:
C, Perl, PHP, MySQL, IRC.

2004 .. 2006

Worked as a software engineer at Computer department of Ternopil National Technical Academy.

I had developed a sophisticated software platform for the university's network infrastructure based on an LDAP directory with a Kerberos-like ticket-based authentication and authorization system on top of an XMPP-protocol.

Developed a high load anti-spam service and a distributed monitoring service on top of XMPP protocol.

Project role:
software architect, software developer, systems and network administrator, project manager.

Tools & technologies:
C, Perl, Python, XUL, Javascript, XMPP, XML, LDAP.

Education

1999 .. 2005

Ternopil National Technical University in Ternopil, Ukraine.

Honors Bachelor's degree in Computer Automation.
Honors Specialist’s degree in Computer Automation.
Honors Master's degree in Computer Automation.